



EPA Region 7 TMDL Review

TMDL ID: NE-NI2-10000, NI3-10000, NI4-10000, NI3-12300, NI3-130000, NI3-130000, NI321900, NI3-22500
Water Body ID: NE-NI2-10000, NI3-10000, NI4-10000, NI3-12300, NI3-130000, NI3-131000, NI3-21900, NI3-22500

Water Body Name: Niobrara River Basin (8 TMDLS)

Tributary: Ponca Creek, Verdigre Creek, Keya Paha River, Long Pine Creek, Plum Creek, Snake River, and Minnechadua creek

Pollutant: E. Coli Bacteria

State: Nebraska

HUC: 10150001, 10150002, 10150003, 10150004, 10150005, 10150006, and 1015007

BASIN:

Submittal Date: December 13, 2005

Approved: Yes

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

A letter dated December 8, 2005 was received by EPA on December 13, 2005, formally submitting this TMDL for approval under Section 303(d).

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

Allocations are based on the expected reduction of the bacteria loading under defined flow conditions, where flow conditions are defined by the presumed ability of point or non-point sources to be the dominant influence on stream water quality. Flow duration curves were developed from the applicable gage station sites and translated into a TMDL load curve by multiplying the flow curve by the water quality criterion (and a conversion factor). The water quality samples are converted to loads by multiplying the samples by the average daily flow and are then plotted on the TMDL load graph. The TMDL curve depicts the WQS and represents a continuum of desired loads over all flow conditions that will attain WQS for bacteria. TMDL values shown on the load duration curves are set at levels which will result in attainment of WQS. Load allocations for the segments are given as percent reductions by segment. NI2-10000 (12%), NI3-10000 (39%), NI3-12300 (67%), NI3-13000 (46%), NI3-13100 (13%), NI3-21900 (12%), NI3-22500 (57%), and NI4-10000 (20%). NPDES permitted facilities which discharge directly into a recreational use segment will be required to meet water quality standards at the end-of-pipe. These limits and reductions should result in water quality standard attainment.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

Eight segments in the Niobrara River Basin were included in the 2004 Nebraska Surface Water Quality Integrated Report as being impaired by excessive *E. coli* bacteria for Primary Contact Recreation. Beneficial uses for all listed segments include: Primary Contact Recreation, Aquatic Life Coldwater Class B and Warm Water Class A, Agriculture and Industrial Water Supply Class A and Aesthetics. The applicable *E. coli* water quality criterion is a recreation season (May 1-September 30) geometric mean of 126 cfu/100mL.

Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

The water quality standard is 126 cfu/100mL as a geometric mean during the recreational period. The WLA will initially be applied to all facilities that discharge directly to recreational segment. LAs are expressed as percent reductions which will result in the target concentration, in the segments identified. The margin of safety is given as an extra percent reduction of the LA to target a concentration 10% below the criterion.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered.

Point sources are identified as those contributing to the *E. coli* impairment within at least one of the main stem segments; municipal wastewater treatment facilities, two fish hatchery/rearing facilities, and numerous confined animal feeding operations. NPDES facilities included are; Nebraska Game & Parks Commission Grove Rearing (NE0001201), Verdigre WWTF (NE0049026), and the Orchard WWTF (NE0122173) into segment NI2-10000, Ainsworth WWTF (NE0112267) into segment NI3-12300, Nebraska Game & Parks Commission Valentine Hatchery (NE0131237) and the Valentine WWTF (NE0051489) into segment NI3-21900, and the Gordon WWTF (NE0039837) into segment NI4-10000.

Nonpoint sources include failing septic tanks or other on-site wastewater systems, run-off from livestock pastures, improper or over-application of biosolids (wastewater treatment facility sludge, septage or manure) and urban storm water run off not regulated by an NPDES permit. Natural sources are also considered from wildlife contributions. All significant sources have been considered at this time.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero.

Allocations are based on the expected reduction of the bacteria loading under defined flow conditions, where flow conditions are defined by the presumed ability of point or non-point sources to be the dominant influence on stream water quality. The demarcation on the load curves between point source and nonpoint sources is the greater of the 7q10 low flow or the stream flow volume necessary to dilute the point source effluents to compliance with the water quality criteria.

WLA Comment

Waste load allocations (WLAs) are provided for the NPDES permitted facilities (including discharges from regulated storm water outfall) as a monthly geometric mean of 126 cfu/100 mL. WLAs are provided for dry weather discharges as seasonal geometric mean of 126 cfu/100 mL. Non-discharging facilities are provided a WLA of zero.

LA Comment

The load allocations are based on the expected reduction of the *E. coli* loading under defined flow conditions, where flow conditions are defined by the presumed ability of point or non-point to be the dominant influence on stream water quality. By segment these reductions are: NI2-10000 (12%), NI3-10000 (39%), NI3-12300 (67%), NI3-13000 (46%), NI3-13100 (13%), NI3-21900 (12%), NI3-22500 (57%), and NI4-10000(20%).

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The TMDLs identify implicit margins of safety; not accounting for decay and/or die off of *E.coli* and the assumption that WWTFs discharge *E. coli* at 126 cfu /100mL, when in fact, many of the plants provide disinfection that is sufficient to achieve 100% reduction in the indicator bacteria

To account for uncertainty in the nonpoint source load reduction, the targeted reductions will be set at 90% of the water quality target (126cfu/100ml). Specifically the reductions shall be applied to meet a seasonal geometric mean of <113cfu/100ml *E. coli*.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Seasonal variation is considered in the recreational season of May 1 – September 30 and is reflected in the TMDL load duration curve, where flows generally depend on the season. Critical conditions are accounted for in the TMDL load duration curve. The analysis for this TMDL only used data from this time period.

Public Participation

Submittal describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

The availability of the TMDLs in draft form was published in the Ainsworth Star-Journal, Midland News, Rock County Leader, Spencer Advocate and the Sheridan County Star with the public comment period running until December 1, 2005, which is more than 30 days. The draft TMDLs were also available to the public on the NDEQ's website during the public notice period.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

Future monitoring will be consistent with Nebraska's rotating basin monitoring scheme; the next targeted monitoring phase for the basin is 2008. An effort is to be made in expanding the monitoring. Compliance monitoring and required self-monitoring information from NPDES permittees will be used in assessing the success of these TMDLs as well. Microbial source tracking may be used in the future as this science progresses to be more user friendly.

Reasonable assurance

Reasonable assurance only applies when reductions in nonpoint source loading is required to meet the prescribed waste load allocations.

Although reasonable assurances are not required for this TMDL because permitted facilities WLA are set to the standard, Nebraska has identified several Federal, State, local, and non-government organizations that may be included in the implementation process, as well as enforcement and compliance measures as needed for NPDES permits.